



National
Metrology
Institute



Training

Gas flow metrology

Gas flow and energy measurement can be challenging in this time of rushing developments. Searching for information to keep your knowledge up to date is difficult and time consuming. The training Gas flow metrology provides information about the backgrounds of gas flow and energy measurements and the pitfalls that can be encountered in these measurements. Participants will be able to immediately identify potential measurement problems and take appropriate measures.

After following the training Gas flow metrology, participants are familiar with:

- The backgrounds of (gas flow) metrology
- Fluid dynamics and gas properties
- Energy measurements for gas composition
- Different aspects of calibration of meters

To achieve this, VSL provides a professional trainer with experience and knowledge of practical examples during this training. Of course there is enough room for your own practical examples and questions, so that participants can apply their acquired knowledge. After the training, the theory will be included in the form of a reference work.

Target audience:

This training is developed for people who are active in gas quantity and energy measurement. Also, people who are responsible for calibration or the initial verification of gas meters, like metering managers and metering engineers, design engineers, station operators, service staff, inspectors and employees responsible for and performing calibration activities.

Registration:

Please go to our website <https://www.vsl.nl/en/services/training/> to fill in the registration form.

Fee:

€ 3.559,00 per participant excluding VAT.

Terms of payment:

Payment in advance. Invoice will be sent 1 month before the start of the training. Payment is due within 30 days after invoice date.

Duration:

5 Consecutive days.

About VSL

VSL is the National Metrology Institute and recognized worldwide. VSL manages and develops primary measurement standards and primary reference materials on the instruction of the Minister of Economic Affairs and Climate Policy. These measurement standards are the foundation for reliable measurements in science, industry and fair trade and other areas. VSL makes measurement results from companies, laboratories and institutions directly traceable to international standards. VSL also participates in research projects to develop newer and better measurement methods.

For more information on VSL and our offerings, please visit our website at <https://www.vsl.nl/en/services/training/>. Should you have any questions or wish to join our PTs, feel free to contact us.



Estimated number of participants:

Minimum 5 participants, maximal 10 participants.

If the number of participants remains smaller than the minimum number of participants, VSL reserves the right to cancel this training and will contact the registered participants to offer an alternative.

Training location:

VSL

Thijsseweg 11

2629 JA Delft

Nederland

Language:

This training will be given in English.

Training content:

The topics that will be discussed are:

- Backgrounds of metrology
 - The structure of metrology
 - Measurement uncertainty
- Legal metrology requirements
 - Structure of legal metrology
 - Legal requirements for gas meters and volume conversion devices
 - Risks of measurement based decisions
- Fluid dynamics and instrumentation
 - Introduction to fluid dynamics
 - Instrumentation for low-pressure gas flows
 - Instrumentation for high-pressure gas flows
- Energy measurement (gas composition)
 - Energy measurement
 - Gas chromatography
 - Performance assessment and evaluation
 - Software and algorithms
- Gas properties
 - Thermodynamic properties of natural gas
 - Gas Custody Transfer
- Calibration of meters
 - Euroloop, the new facility for calibration of flow meters
 - LNG measurements and standards
 - Calibration models, uncertainty of calibration
 - Building-up traceability, calibration facilities
 - Hands-on training Calibration of flow meters in VSL laboratories

VSL

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